blood pressure 134.9mmHg (22.0) and total cholesterol of 189.8 mg/dl (48.7). The expected five-year cumulative MACE event rate was 9.2% and HbA1c reductions of 0.5%, 1.0% and 1.5% produced relative risk reductions of 7.5%, 9.0% and 10.6% respectively. At the 5% level, the number of patients required to detect a significant reduction in MACE events was 17,786, 11,758 and 1,912 for HbA1c reductions of 0.5%, 1.0% and 1.5% respectively. On average, each half-unit change in HbA1c required an additional 7,937 subjects to detect a significant difference in MACE event rate. **CONCLUSIONS:** Given the requirement to extensively validate health economic models to contemporary outcomes studies it is an obvious extension to use these models to inform on the design of clinical trials. These models offer considerable flexibility in the evaluation of sample size requirements in terms of expected changes in modifiable risk factors.

PRM74

DEVELOPING REALISTIC PATHWAYS IN COST-EFFECTIVENESS MODELS FOR PSORIASIS: WHAT TO DO WHEN A BIOLOGIC FAILS

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OBJECTIVES: Clinical studies indicate switching to a second biologic or combination therapy with an immunosuppressant after failure of first biologic can be effective in patients with moderate to severe plaque psoriasis not responding to the first biologic. **METHODS:** A systematic literature review was performed to assess treatment pathways included in cost-effectiveness (CE) estimates of biologic treatments of moderate to severe psoriasis and compare these pathways with those recommended in psoriasis treatment guidelines. **RESULTS:** Twenty-one CE modeling studies were identified. Of these 10 estimated incremental cost per responder for >=1 biologics over time horizons varying from 12 weeks to 18 months. Treatment pathways were considered not relevant in these studies. In 11 studies with time horizons up to 10 years where treatment pathways were considered, 5 studies included a switch to non-systemic therapy or best supportive care after failure of the initial biologic. In 6 of 11 studies, failure of the initial biologic was followed by monotherapy with a second-line biologic - one of the recommendations in current treatment guidelines. In only 1 of 6 studies that considered treatment sequencing was the efficacy of the second-line biologic adjusted downwards compared to first line treatment. None of the cost-effectiveness analyses included dose titration with the first-line biologic or combination therapy with a biologic plus methotrexate or phototherapy after failure of the first-line biologic as recommended in some treatment guidelines. **CONCLUSIONS:** In most long term CE studies, failure of the first biologic was followed by biologic monotherapy of the second, without efficacy adjustment. Some treatment guidelines support dose titration or combination treatment after failure of a first-line biologic. Nevertheless, these options were not included in the published CE models with time horizons up to 10 years. For decision makers there may be a need for more extensive models where such strategies are allowed.

PRM75

DECISION ANALYTIC MODELS USED IN ESTIMATING THE COST-EFFECTIVENESS OF DRUG-ELUTING STENTS VERSUS BARE-METAL STENTS: A SYSTEMATIC REVIEW

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OBJECTIVES: Drug-eluting stents (DES) and bare-metal stents (BMS) are both used widely in percutaneous coronary interventions. However, cost-effectiveness analyses of DES versus BMS conflict about whether the reduction in repeat revascularizations of DES versus BMS offsets the initial higher treatment costs of DES. A systematic review was performed to examine whether modelling methods influenced the cost-effectiveness of DES versus BMS. **METHODS:** We reviewed modelling studies published until January 2012 that compared the costs and consequences of DES versus BMS. General information (e.g. funding) and modelling methods used, related to the framing of the economic evaluation (e.g. population and intervention characteristics, time horizon) and parameterisation of the models were extracted from the relevant studies for each of the individual analyses performed in the studies. Associations between these characteristics and the incremental costs and effectiveness were explored using regression analysis. We also examined whether the results were associated with the quality of the models based on the Philips et al. (2006) checklist. **RESULTS:** Fifteen eligible studies accounted for 498 separate analyses, in which the incremental cost-effectiveness ratios ranged from DES being dominated by BMS to DES being dominant. The most important predictors significantly associated with these differences were several population and procedure characteristics, funding and assumptions concerning stent efficacy. The results and conclusions of individual studies corresponded with the findings of this meta-level systematic review. Overall quality of the models was moderate (55%±17%) and significantly negatively associated with repeat revascularizations avoided. **CONCLUSIONS:** Models are important to obtain valid estimates of the cost-effectiveness of DES versus BMS, and framing decisions (e.g. time horizon) and quality of the models both influence incremental costs and effects. The most influential parameters are identified with this systematic review and we showed the need of examining those parameters and of performing a quality check when interpreting the results.

PRM76

EXPLORATORY STRUCTURAL EQUATION MODELS: A SIMULATION STUDY EXPLORING GEOMIN AND TARGET ROTATION TECHNIQUES ON VARIATIONS OF ESEM MODELS

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OBJECTIVES: This simulation study evaluates the impact of Geomin and Target rotation criteria on factor loading matrices in the recently developed exploratory structural equation models (ESEM), a method that can be considered a strong alternative to the exclusive use of exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) in patient related outcomes measurement. By combining the steps of EFA and CFA in one unified approach, ESEM saves significant time and effort usually invested in separate iterations of EFA and CFA. **METHODS:** One hundred replications of ESEM models were carried out for variations of sample size and latent factors. *Simulation study 1* examined the behavior of ESEM parameter estimates by changing the values of rotation constant (0.01, 0.001 and 0.0001) in Geomin rotation for a *three-factor single group* model and for N=300 and 1000. Simulation study 2 evaluated the behavior of ESEM parameter estimates for multi-group models using three- and four-factor models for N=150 and 500 per group. Bias, Mean Square Errors (MSE) and standard errors were used to evaluate accuracy of parameter recovery. Item parameters were generated from 27 items belonging to a pilot graduate creativity instrument. **RESULTS:** For study 1, Geomin rotated parameter estimates of factor loadings, means and covariances produce higher MSEs than the follow up Target rotations. In study 2, the parameter estimates for ESEM Geomin show small sample size bias for some parameters while the standard errors produced correct coverage for all parameters under Target rotation method for large N=500 per group. **CONCLUSIONS:** Overall, there was accurate recovery of parameter estimates in the smallest sample of 300 especially in the multi-group models specifically when Geomin rotations were employed. This bodes well for analysis of real data and for the study of measurement invariance across groups. Future studies could include the examination of number of items affecting recovery of parameter estimates.

PRM77

METHODOLOGICAL APPROACHES FOR MODELING CARDIOVASCULAR EVENTS IN COST-EFFECTIVENESS ANALYSES BASED ON OUTCOME TRIALS

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OBJECTIVES: Historically, cardiovascular (CV) endpoints, including myocardial infarction and stroke, have often been included indirectly in cost-effectiveness analyses (CEA) based on surrogate endpoints from clinical trials, such as cholesterol levels, blood pressure or glycemic control. With the availability of outcomes trials sufficiently powered to show differences in CV endpoints, there is an increasing need to incorporate these data directly into CEA. This study investigated approaches available in the published literature for modeling CV endpoints directly based on outcomes data. **METHODS:** A systematic review of cost-effectiveness models for cardiovascular interventions published in the past 5 years was conducted in PubMed and Embase using a predefined search strategy. Only studies in English language directly integrating trial data on CV endpoints from randomized clinical trials were considered. For each study that met the inclusion criteria, clinical input characteristics and the modeling approach were summarized and evaluated. **RESULTS:** Twenty-three papers were identified for final review, including studies of antithrombotic, heart failure, and lipid lowering therapies. Methodologically, decision trees, Markov models (cohort and individual patient), discrete event simulations as well as hybrids of these approaches were used. Event rates were incorporated either as constant rates, time-dependent risks, or risk equations based on patient characteristics. Although potentially more accurately reflecting the trial data, risks dependent on time and/or patient characteristics were only used where feasible (major event rates >1%/year) and practical (models with fewer than seven health states). Models incorporating data from infrequent events or with numerous health states generally preferred constant event rates. **CONCLUSIONS:** When the risk of CV events is low and/or the disease state is explicitly modeled in detail, constant events rates were most common. For heterogeneous populations or when CV event risk is high, simpler model structures were generally accompanied by patient- or time-dependent event rates where permitted by the available data.

PRM78

TWO-WAY SENSITIVITY ANALYSIS: SHOWING THE IMPACT OF CORRELATED PARAMETERS IN COST-EFFECTIVENESS ANALYSES

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OBJECTIVES: Correlated parameters are a common feature in economic models, but no standard sensitivity analysis (SA) exists to show their impact on cost-effectiveness. The one-way SA only varies one parameter at a time and ignores correlation while the probabilistic SA is typically used to address overall uncertainty. The objective of this study is to propose a standard method for visualising the impact of one variable consisting of two correlated parameters in cost-effectiveness analysis. **METHODS:** A model evaluating the cost-effectiveness of a cancer product was used. Using the Cholesky decomposition, 1,000 correlated random draws were generated from the distributions of the intercept and slope of a linear function determining survival in the model. Each pair was inputted in the model to yield the percentage of simulations below accepted thresholds. Results were visualised using R in a scatter plot with both parameters on a separate axis. Shaded areas represented the percentage of simulations below accepted cost-effectiveness thresholds and an ellipse was added representing 80% of the simulated parameter combinations. A conventional one-way SA was performed for comparison. **RESULTS:** The one way SA found wide ranges of incremental cost-effectiveness ratios (ICER) for the intercept and slope parameters (£10,000 - £50,000 per QALY gained). The method described above found that 78% of the simulated pairs resulted in ICERs below £20,000 per QALY gained, and 93% in ICERs below £30,000. The scatter plot visualised the combined uncertainty and their impact on the ICER. A limitation is that the visualisation only allows for 2 correlated parameters. Also, the use of R to generate the graph complicates incorporation of this SA in Excel models. **CONCLUSIONS:** A method was demonstrated to show the impact of correlated parameters in cost-effectiveness analyses. This method may be especially helpful when assessing the uncertainty around parametric survival fits.